

SHORT COMMUNICATION

In vitro thrombolytic activity of Sri Lankan black tea (*Camellia sinensis* L.)

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Abstract: This study examined the thrombolytic potential of black tea [*Camellia sinensis* (L) O. Kuntze.] *in vitro*, using Sri Lankan high grown Dust grade No: 1 black tea and goat blood. Different concentrations of tea were made in isotonic saline (2.5, 5, 10 and 20 mg/ml, equivalent to 1.5, 3, 6, 12 cups respectively; 1 cup = 170 ml) and added to preclotted blood and the clot lysis activity was determined (in terms of weight and expressed as % of lysis) following 90 min incubation at 37 °C. The results showed that, tea induced mild to moderate (121-520%) and significant ($P < 0.05$) clot lysis activity. This effect was dose-related. However, the clot lytic activity of black tea was markedly lower than streptokinase (0.1 mg/ml). It is concluded that Sri Lankan black tea possesses fast acting mild to moderate thrombolytic activity *in vitro* when tested in goat blood.

Key words: Black tea, *Camellia sinensis*, clot lysis, Dust grade tea, thrombolytic

INTRODUCTION

Tea which is produced from tender shoots of *Camellia sinensis* (L.) O. Kuntze (Family: Theaceae) plant is the most consumed beverage in the world besides water. Based on the manufacturing process there are three major types of tea: black (fully aerated or fermented); green (unaerated or unfermented) and oolong (partially aerated or semi fermented)^{1,2}. Several studies have shown that, tea especially the black and green types, impair blood clotting in man and animals^{1,3}. Further, it is hypofibrinogenic and shown to inhibit platelets aggregation in rabbits both *in vivo* and *in vitro*^{1,2,4,5}. As such, tea is claimed to be cardioprotective^{1,2}. However, less attention has been focused on clot lysing activity of tea. Since tea contains a variety of water soluble phytoconstituents^{1,6} it is possible that tea may affect thrombolysis. Thus, the aim of this study was to examine the thrombolytic potential of black

tea *in vitro*. This was tested using Sri Lankan Dust grade No 1 black tea. Black tea was selected as it accounts for 70% of global tea production and 80% of global tea consumption^{1,2}. Dust grade tea was selected since it is most commonly consumed type of tea in Sri Lanka.

MATERIALS AND METHODS

Dust grade No: 1 tea that was manufactured (on 11-08-2005) at St. Coombs estate tea factory (1362 m above mean sea level) of the Tea Research Institute, Talawakelle, Sri Lanka, with its own green leaves, using orthodox-rotorvane manufacture technique was used. Tea samples were packed in triple laminated aluminum foil bags and stored at -20 °C until use. Black tea brew/infusion was made according to the ISO standards⁷: 2 g of tea in 100 ml boiling water and brewed for 5 min. This was then freeze dried and was used to make different concentrations in isotonic saline: 2.5, 5, 10 and 20 mg/ml, equivalent to 1.5, 3, 6, 12 cups respectively (1 cup = 170 ml).

Goat blood was collected from Colombo Municipal Slaughter house, Dematagoda and immediately citrated using 3.1% sodium citrate solution⁸. Thousand microlites of this blood was added to preweighed microcentrifuge tubes. Two hundred microlites of 2% calcium chloride was then added to each of these tubes¹, mixed well and incubated at 37 °C for 45 min for clotting to occur. Clot lysis activity was determined as described by Prasad et al. (2006)⁵. Briefly, after clot formation, serum was aspirated out without disturbing the clot and each of these tubes was weighed again to determine the weight of the clot. Thousand microlites of different concentrations of the tea extract, 2.5 mg/ml (n = 52), 5 mg/ml (n = 77), 10 mg/ml (n = 80) and 20 mg/ml (n = 50) or saline (n = 66)

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